

REMARKS

Amendments

Amendments to the Claims

Applicant has amended the claims to more particularly point out what Applicant regards as the invention. Specifically, Applicant claims a first multichromatic filter transmitting at least three imaging channels to a first sensor and a second multichromatic filter transmitting at least three imaging channels to a second sensor, with each transmitted imaging channel corresponding to a different color. Furthermore, Applicant claims the processing a first and second set of wavelengths associated with the first and second set of imaging channels to calculate a spectral reflectance and a digital representation of an object. No new matter has been added as a result of these amendments because support for these amendments can be found, *intra alia*, in paragraphs 12, 13, and 17-20.

Rejections

Rejections under 35 U.S.C. § 102(e)

Claims 1, 3, 4, 13, and 35

Claims 1, 3, 4, 13, and 35 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Roddy, U.S. Patent 7,057,654. Applicant respectfully submits that Roddy qualifies as prior art under 35 U.S.C. § 102(a) based on its publication date of August 28, 2003. Applicant respectfully submits that Roddy does not teach each and every element of the invention as claimed in claims 1, 3, 4, 13, and 35.

Roddy discloses a camera that captures four color channels using two sensors and a set of filters. The color channels correspond to red, green, blue, and a fourth color that is blue-green.

In claims 1, 3, 4, 13, and 35, Applicant claims a first multichromatic filter transmitting at least three imaging channels to a first sensor and a second multichromatic filter transmitting at least three imaging channels to a second sensor, with each transmitted imaging channel corresponding to a different color. Furthermore, Applicant claims processing sets of wavelengths corresponding to the imaging channels to calculate

a surface reflectance and a digital representation of an object. Because, Roddy suggests a maximum of four colors and not six colors as claimed, Roddy cannot teach or suggest two multichromatic filters transmitting at least six imaging channels to two sensors, where each imaging channel corresponds to a different color, as claimed. Furthermore, Roddy does not teach or suggest calculating the spectral reflectance of an object as claimed.

In addition, in claim 35, Applicant further claims that the second set of wavelengths includes one imaging channel corresponding to a color that is less than blue wavelengths, one imaging channel corresponding to a color that is in between green and blue wavelengths, one imaging channel corresponding to a color that is in between red and green wavelengths, and one imaging channel corresponding to a color that is above red wavelengths. Because Roddy discloses only transmitting red, green, blue, and blue-green colors, Roddy cannot teach or suggest the claimed element.

Therefore, Applicant respectfully submits that the invention claimed in claim 1, 3, 4, 13, and 35 is not anticipated by Roddy under 35 U.S.C. § 102(a). Accordingly, Applicant respectfully requests the withdrawal of the rejection of the claims.

Claims 1, 5, and 6

Claims 1, 5, and 6 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Jang, 6,373,523. Applicant respectfully submits that Jang does not teach each and every element of the invention as claimed in claims 1, 5, and 6.

Jang discloses a camera that captures four color components using two sensors and mutually different color filter arrays. For the first sensor, a first color filter array transmits "magenta+cyan" and "green+cyan" colors, whereas a second sensor color filter array transmits "green+yellow" and "magenta+yellow" color components.

In claims 1, 5, 6, Applicant claims a first multichromatic filter transmitting at least three imaging channels to a first sensor and a second multichromatic filter transmitting at least three imaging channels to a second sensor, with each transmitted imaging channel corresponding to a different color. Because, Jang discloses only transmitting four colors and not six colors as claimed, Jang cannot teach or suggest two multichromatic filters transmitting a total of at least six imaging channels to two sensors, where each imaging

channel corresponds to a different color, as claimed. Furthermore, Jang does not teach or suggest calculating the surface reflectance of an object as claimed.

Therefore, Applicant respectfully submits that the invention claimed in claim 1, 5, and 6 is not anticipated by Jang under 35 U.S.C. § 102(b). Accordingly, Applicant respectfully requests the withdrawal of the rejection of the claims.

Rejections under 35 U.S.C. § 103(a)

Claims 8 and 10

Claims 8 and 10 stand rejected under 35 U.S.C. § 103(a) as being obvious by Roddy and Examiner's Official Notice. The Examiner admits that Roddy does not teach or suggest color filters having three or four colors and takes Official Notice that this missing element is well-known in the art. Applicant respectfully submits that this combination does not teach or suggest each and every element in claims 8 and 10.

Claims 8 and 10 depend on independent claim 1. In independent claim 1, as amended, Applicant claims processing sets of wavelengths corresponding to the sets of imaging channels to calculate a surface reflectance and a digital representation of an object. As per above, Roddy does not teach or suggest the claimed element. Furthermore, the Examiner's Official Notice cannot fill in the gap.

Therefore, Roddy and Examiner's Official Notice cannot be properly interpreted as rendering obvious Applicant's invention as claimed in claim 1 and claims 8 and 10 that depend on it. Accordingly, Applicant respectfully submits that the invention claimed in claims 8 and 10 is not rendered obvious by Roddy under 35 U.S.C. § 103(a) and respectfully request the withdrawal of the rejection of the claims.

Claims 2, 14-17, 19, and 25, 27, 29

Claims 2, 14-17, 19, and 25, 27, 29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Roddy and Noguchi et al., U.S. Patent No. 6,885,394 (previously cited). Applicant respectfully submits that this combination does not teach each and every element of the invention as claimed in claims 2, 14-17, 19, and 25, 27, 29.

Noguchi discloses a photographic system with at least four CCD sensors each capable of sensing a focused image in different wavelength regions. Noguchi further

discloses that the wavelength regions are clustered around a single different wavelength (e.g., see Noguchi, Figs. 3 and 5).

In claims 2, 14-17, 19, and 25, 27, 29, Applicant claims a first multichromatic filter transmitting at least three imaging channels to a first sensor and a second multichromatic filter transmitting at least three imaging channels to a second sensor, with each transmitted imaging channel corresponding to a different color. The Examiner admits that Noguchi does not teach or suggest two coupled sensors with each sensor sensing different groups of wavelengths (see Office Action January 24, 2008, p. 9). Thus, Noguchi cannot teach or suggest the claimed element. Neither does Roddy.

Therefore, the combination cannot render obvious Applicant's invention as claimed in claims 2, 14-17, 19, and 25, 27, 29, and Applicant respectfully requests the withdrawal of the rejection of the claims under 35 U.S.C. § 103(a) over the combination.

Claims 22, 24, 32 and 34

Claims 22, 24, 32 and 34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Roddy, Noguchi, and Vilaseca, et al. ("Spectral-reflectance reconstruction in the near-infrared region by use of conventional charge-coupled device camera measurements") (previously cited). Applicant respectfully submits that this combination does not teach each and every element of the invention as claimed in claims 22, 24, 32 and 34.

Vilaseca discloses calculating reflectance spectra of an image in the near-infrared using a conventional CCD camera.

Claims 22, 24, 32, and 34 depend on independent claims 15 and 25. In independent claims 15 and 25, Applicant claims a first multichromatic filter transmitting at least three imaging channels to a first sensor and a second multichromatic filter transmitting at least three imaging channels to a second sensor, with each transmitted imaging channel corresponding to a different color. Because Vilaseca does not disclose the conventional CCD camera as having more than one sensor, Vilaseca cannot teach or suggest a first multichromatic filter transmitting at least two imaging channels to a first sensor and a second multichromatic filter transmitting at least two imaging channels to a second sensor, with each transmitted imaging channel corresponding to a different color

as claimed. Neither does Roddy or Noguchi. Thus, none of Roddy, Noguchi or Vilaseca teaches or suggests the claimed element.

Therefore, the combination cannot render obvious Applicant's invention as claimed in claims 15 and 25 and claims 22, 24, 32, 34 that depend on them, and Applicant respectfully requests the withdrawal of the rejection of the claims under 35 U.S.C. § 103(a) over the combination.

Claims 23 and 33

Claims 23 and 33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Roddy, Noguchi, and Arai, U.S. Patent 5,864,834 (previously cited). Applicant respectfully submits that this combination does not teach each and every element of the invention as claimed in claims 23 and 33.

Arai discloses a neural network used to estimate spectral reflectance distribution of an image.

Claims 23 and 33 depend on independent claims 15 and 25. In independent claims 15 and 25, Applicant claims a first multichromatic filter transmitting at least three imaging channels to a first sensor and a second multichromatic filter transmitting at least three imaging channels to a second sensor, with each transmitted imaging channel corresponding to a different color. Because Arai does not disclose a device that captures the image, Arai cannot teach or suggest the claimed element. Furthermore, neither Roddy nor Noguchi teaches or suggests this element.

Therefore, the combination of Roddy, Noguchi, and Arai cannot render obvious Applicant's invention as claimed in claims 15 and 25 and claims 23 and 33 that depend on them, and Applicant respectfully requests the withdrawal of the rejection of the claims under 35 U.S.C. § 103(a) over the combination.

SUMMARY

Claims 1-6, 8, 10, 13-15, 17, 22-25, 27, 29, and 32-35 are currently pending. In view of the foregoing amendments and remarks, Applicant respectfully submits that the pending claims are in condition for allowance. Applicant respectfully requests reconsideration of the application and allowance of the pending claims.

If the Examiner determines the prompt allowance of these claims could be facilitated by a telephone conference, the Examiner is invited to contact Eric Replogle at (408) 720-8300 x7514.

Deposit Account Authorization

Authorization is hereby given to charge our Deposit Account No. 02-2666 for any charges that may be due. Furthermore, if an extension is required, then Applicant hereby requests such extension.

Respectfully submitted,

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